

## CLAIMS

1. An electromagnetic machine with a deformable diaphragm (1; 41; 51), the machine comprising at least one stationary part (6, 7; 16, 17; 16', 17'; 26, 27; 56, 57) suitable for channeling a magnetic flux that interacts with at least one moving part (10; 20; 20'; 30; 60) having regions that are magnetically polarized (N, S) in such a manner that alternating displacement of the moving part and alternating magnetic flux variation in the stationary part correspond, the moving part being drivingly connected to an edge (5; 45; 55) of the diaphragm such that alternating displacement of the moving part corresponds to deformation of the diaphragm, the machine being characterized in that the stationary part and the moving part are arranged to confer rotary type displacement to the moving part.
2. A machine according to claim 1, characterized in that the moving part(s) (10; 20; 20'; 30; 60) is/are substantially circularly cylindrical in shape and is/are constrained to turn substantially about its/their geometrical axis (or axes).
3. A machine according to claim 1, characterized in that the or each stationary part comprises at least one coil (6; 16; 16'; 56) having a core (7; 17; 17'; 57) passing therethrough to form a magnetic path for the magnetic flux, which path is interrupted by one or more spaces extending between pairs of active walls (9; 19, 19'; 29) of the core, the or each moving part comprising a body defined by two parallel faces (13) between which there extend magnetically polarized regions (N, S) that are disposed in circumferential manner so that two adjacent regions have opposite polarities, the or each moving part (10; 20; 20'; 30; 60) being disposed in a space of the core (7; 17; 17'; 57) in such a manner that the faces of

the active portions of the moving part extend facing the active walls of the core.

4. A machine according to claim 3, characterized in that  
5 the active walls (9; 19; 19'; 29) of the core (7; 17; 17'; 57) extend facing a central portion of the facing moving part (10; 20; 20'; 30; 60) and present an area that is less than the area of the magnetically polarized regions of said moving part.
- 10 5. A machine according to claim 1, characterized in that the edge (5; 45; 55) of the diaphragm is engaged in a peripheral notch (12) of the moving part.
- 15 6. A machine according to claim 1, characterized in that a connection member (15) extends between the edge of the diaphragm (1) and the moving part (20).
- 20 7. A machine according to claim 1, characterized in that the diaphragm (1; 41) is circular or tubular, and in that the electromagnetic machine has a plurality of moving parts (10; 40) arranged to be diametrically opposite in pairs and to turn in opposite directions.
- 25 8. A machine according to claim 1, characterized in that the moving parts (20) present unbalance disposed to compensate for the alternating inertial forces of the diaphragm (1).
- 30 9. A machine according to claim 1, characterized in that the diaphragm (1) extends between two rigid plates (2, 3) of shapes that are adapted to impart traveling wave motion to the diaphragm (1) when the diaphragm is driven by the moving parts (10).